



Docket No.: 209937US2

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313



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RE: Application Serial No.: 09/884,115

Applicants: Shigeto ADACHI, et al.

Filing Date: June 20, 2001

For: HIGH VOLTAGE TREATMENT EQUIPMENT AND
METHOD FOR LIQUID

Group Art Unit: 1753

Examiner: MAYEKAR, K.

SIR:

Attached hereto for filing are the following papers:

APPEAL BRIEF UNDER 37 C.F.R. §1.192

Copy of In re Margolis, 785 F.2d 1029, 228 USPQ 940 (Fed. Cir. 1986)

Our credit card payment form in the amount of \$330.00 is attached covering any required fees. In the event any variance exists between the amount enclosed and the Patent Office charges for filing the above-noted documents, including any fees required under 37 C.F.R. 1.136 for any necessary Extension of Time to make the filing of the attached documents timely, please charge or credit the difference to our Deposit Account No. 15-0030. Further, if these papers are not considered timely filed, then a petition is hereby made under 37 C.F.R. 1.136 for the necessary extension of time. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

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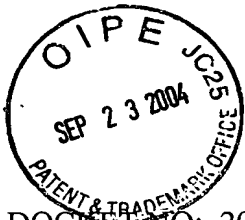
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DOCKET NO: 209937US2

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :
SHIGETO ADACHI, ET AL. : EXAMINER: MAYEKAR, K.
SERIAL NO: 09/884,115 :
FILED: JUNE 20, 2001 : GROUP ART UNIT: 1753
FOR: HIGH VOLTAGE TREATMENT :
EQUIPMENT AND METHOD FOR
LIQUID

APPEAL BRIEF UNDER 37 C.F.R. §1.192

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

SIR:

Appellants herein appeal the final rejection of Claims 1-5, 8, 10-15 and 22-23, for the reasons set forth below.

REAL PARTY IN INTEREST

The real party in interest in the present application is the assignee of record, KOBE STEEL, LTD of Japan.

RELATED APPEALS AND INTERFERENCES

There are no related appeals, interferences or judicial proceedings.

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STATUS OF CLAIMS

Claims 1-5, 8, 10-15 and 22-23 are active and finally rejected. Claims 6, 7, 9 and 16-21 have been cancelled.

STATUS OF AMENDMENTS

All amendments have been entered.

SUMMARY OF CLAIMED SUBJECT MATTER

The invention is directed to a high voltage treatment apparatus which is able to achieve a high field strength between the electrodes, one of which is arranged to be dipped into a liquid, even at relatively low voltages. For example, referring to the non-limiting embodiment of the figures, an electrode 25 of the pair of electrodes 25-26 may be a rod-like electrode arranged to be dipped in a liquid and supplied with a pulsed power from a power source 27. The invention is based upon a recognition of the ability to achieve an unexpectedly high field strength in such an apparatus where the rod-like electrode has a diameter of not more than 1 mm. In such a case, it is possible to achieve a high field strength larger than 500 kV/cm in the vicinity of the at least one electrode which is immersed in a liquid.

For example, referring to Figure 4 of the present specification, a study was made to determine the field strength generated in the vicinity of the electrode as the diameter of the rod electrode 25 changes. As can be seen from Figure 4, in the case of pulsed power of 70kV (page 12, line 5), the field strength increased with decreased distance from the electrode surface. For rod-like electrode diameters of 5 mm and 10 mm, the increase remained substantially linear throughout the range of distances from the electrode surface. However,

for electrode diameters smaller than 1 mm the field strength increased *exponentially* near the electrode surface. Thus, there was discovered to be a difference in kind, rather than merely degree, for the increase in field strength where the electrode diameter was 1 mm or less.

Moreover, the improved result shown in Figure 4 would have been unexpected by those skilled in the art. For example, in Figure 8 the curve marked by “squares” represents the field strength calculated according to the standard field strength equation 1 on page 13 of the specification. As was expected, the calculated field strength increased as the distance from the electrode surface decreased. However, the actual field strength determined under simulated conditions, and represented by the curve indicated by “diamonds,” increased at a substantially greater rate than was expected by simple calculation. That is, consistent with Figure 4, Figure 8 illustrates an unexpected physical mechanism which dramatically increases the field strength for small diameter electrodes (in this case, 0.25 mm).

Based upon the unexpected improved results illustrated in the graphs of Figures 4 and 8, Claim 1 recites that the electrodes are constituted so that a region whose field strength is raised to a value larger than 500 kV/cm is present in the vicinity of the at least one electrode which is dipped in a liquid. Claims 2, 8 and 22-23 recite that the rod-shaped electrode has a diameter of not more than 1 mm. Claim 22 recites the field strength raised to a value larger than 500 kV/cm in combination with the electrode diameter being not more than 1 mm, and Claim 23 further recites that the corresponding voltage is not more than 100 kV. As is evident from Figure 4, it is only in the case where the electrode diameter is 1 mm or less that one is able to achieve a field strength of at least 500 kV/cm.

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-5, 8, 10-15 and 22-23 stand finally rejected under 35 U.S.C. § 103 as being obvious over U.S. patent 6,491,797 (Locke et al.).

ARGUMENT

All of the claims were finally rejected under 35 U.S.C. § 103 as being obvious over Locke et al for “reasons as of record” in the Office action of September 9, 2003. Locke et al discloses a method for oxidizing organic contaminants using pulsed energization of a hypodermic needle electrode submerged in an aqueous solution (Fig. 2). The diameter of the electrode is not described in the reference, however the field strength is disclosed as being a “very high” field strength of about 100 kV/cm (col. 8, lines 6-7).

The Examiner had taken the position, in the Office action of September 9, 2003, that the wire or hypodermic needle electrode of Locke et al.” appears to lead one [of] ordinary skill in the art at the time the invention was made towards the range of the recited diameter in absence of evidence to the contrary.” However, “evidence to the contrary” is present in the form of the description of unexpected improved results in the specification. A *prima facie* case of obviousness can be overcome by the submission of objective evidence of nonobviousness. Such objective evidence of nonobviousness can include comparative data in the specification. In re Margolis, 785 F.2d 1029, 228 USPQ 940 (Fed. Cir. 1986); M.P.E.P. § 716.01(a). Evidence showing that the claimed range achieves unexpected results can establish the requisite criticality for overcoming a *prima facie* case of obviousness. M.P.E.P. § 2144.05 (III). Thus, even to the extent that the Examiner is correct that the hypodermic needle or wire electrode in Locke et al. would lead one of ordinary skill in the art toward the claimed range, any resulting conclusion of obviousness would be overcome by evidence in

the present specification of improved and unexpected results derived from the claimed invention. Here, as already discussed, providing a rod diameter of 1 mm or less (Claims 2, 3-5, 8, 10-15, 22-23) produces a field strength which unexpectedly increases exponentially near the electrode surface, as compared to the substantially linear increases in field strength for larger diameter electrodes. This objective evidence of unobviousness found in the specification demonstrates results which are unexpected from the prior art and would overcome any *prima facie* case of obviousness that may be established by Locke et al.

Claim 1 recites that the pair of electrodes are constituted so that the field strength is greater than 500 kV/cm in the vicinity of the at least one electrode dipped in the liquid. The Examiner has alleged that the disclosure of Locke et al. “appears to lead one [of] ordinary skill in the art at the time the invention was made towards the overlapping range of the field strength in absence of evidence to the contrary.” However, the description in Locke et al. of a 100 kV/cm field strength as being “very high” evidences that a *fivefold* increase to a 500 kV/cm field strength would have been unexpected to those skilled in the art and, indeed, teaches away from a field strength of more than 500 kV/cm. (“A *prima facie* case of obviousness may also be rebutted by showing that the art, in any material respect, teaches away from the claimed invention;” *Id.*).

Moreover, here as well, evidence of unexpectedly improved results is present in the present specification. For example, Figure 4 illustrates that a construction having an electrode diameter of greater than 1 mm is unable to achieve a field strength higher than about 200 kV/cm. A field strength of 500 kV/cm would be unexpected in view of this apparent limit. This objective evidence of unexpectedly improved results overcomes any *prima facie* case of obviousness which may have been established by Locke et al.

Both of the above arguments apply to Claims 22-23 which recite both an electrode diameter of not more than 1 mm *and* a field strength of more than 500 kV/cm (at a voltage of not more than 100 kV; Claim 23).

The Examiner has alleged, in paragraph 8 of the Office action of March 24, 2004, that the claimed distinctions over the prior art are "in the manner of operating the device."

However, it is noted that an electrode diameter of not more than 1 mm is a structural limitation, as is a pair of electrodes "constituted" so that a field strength is larger than 500 kV/cm. Thus, the claims structurally distinguish over the prior art.

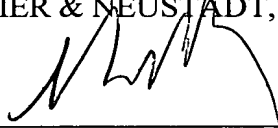
Appellants therefore respectfully submit that the outstanding rejection is improper and should be REVERSED.

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CLAIMS APPENDIX

Claim 1. (Rejected) A high voltage treatment equipment for liquid comprising:
a pair of electrodes, at least one electrode out of said pair of electrodes being arranged so as to be dipped into liquid; and
means for applying a pulsed power between electrodes of said pair of electrodes, wherein said pair of electrodes are constituted so that a region whose field strength is raised to a value larger than 500 kV/cm is present in the vicinity of said at least one electrode dipped into said liquid.

Claim 2. (Rejected) A high voltage treatment equipment for liquid comprising:
a pair of electrodes, at least one electrode out of said pair of electrodes being arranged so as to be dipped into liquid; and
means for applying a pulsed power between electrodes of said pair of electrodes, wherein at least one electrode dipped into said liquid is a rod shaped electrode whose diameter is not more than 1 mm.

Claim 3. (Rejected) The high voltage treatment equipment for liquid according to claim 2, wherein voltage of said pulsed power is not more than 100 kV.

Claim 4. (Rejected) The high voltage treatment equipment for liquid according to claim 2, wherein an extreme end of said rod shaped electrode is formed to be hemisphere.

Claim 5. (Rejected) The high voltage treatment equipment for liquid according to claim 2, wherein said rod shaped electrode is an anode electrode.

Claims 6-7. (Cancelled).

Claim 8. (Rejected) A high voltage treatment equipment for liquid comprising:
a pair of electrodes, at least one electrode out of said pair of electrodes being arranged so as to be dipped into liquid, wherein at least one of said electrodes is a rod shaped electrode whose diameter is not more than 1 mm;

means for applying a pulsed power between electrodes of said pair of electrodes; and
a movement mechanism for moving at least one electrode dipped into said liquid so as to change a relative position with respect to the other electrode.

Claim 9. (Cancelled).

Claim 10. (Rejected) The high voltage treatment equipment according to claim 8, wherein the other electrode is a tubular or ring shaped electrode, and a relative positional relationship between said rod shaped electrode and said tubular or ring shaped electrode can be changed while maintaining a state that said rod shaped electrode passes a center point or an axial center of said tubular or ring shaped electrode.

Claim 11. (Rejected) The high voltage treatment equipment according to claim 10, wherein an end of said rod shaped electrode is positioned in the vicinity of the tubular or ring shaped electrode.

Claim 12. (Rejected) The high voltage treatment equipment according to claim 10 wherein, said rod shaped electrode is moved by said movement mechanism.

Claim 13. (Rejected) The high voltage treatment equipment according to claim 12, wherein said movement mechanism is a winding mechanism, which winds the linear electrode.

Claim 14. (Rejected) The high voltage treatment equipment according to claim 8, further comprising:

means for measuring a discharge voltage or a discharge current to said liquid; and control means for controlling a movement speed of a relative position of an electrode by said movement mechanism on the basis of the value measured by said means for measuring a discharge voltage or a discharge current.

Claim 15. (Rejected) The high voltage treatment equipment according to claim 8, further comprising:

means for measuring the flow rate, conductivity or impedance of said liquid; and control means for controlling a value of voltage applied by said means for applying the high voltage on the basis of the value measured by said means for measuring the flow rate, conductivity or impedance of liquid.

Claims 16-21. (Cancelled).

Claim 22. (Rejected) A high voltage treatment equipment for liquid comprising:
a pair of electrodes, at least one electrode out of said pair of electrodes being arranged
so as to be dipped into liquid; and
means for applying a pulsed power between electrodes of said pair of electrodes,
wherein at least one electrode dipped into said liquid is a rod shaped electrode whose
diameter is not more than 1 mm, whereby a field strength of a region in the vicinity of said at
least one electrode may have a value larger than 500 kV/cm.

Claim 23. (Rejected) A high voltage treatment equipment for liquid comprising:
a pair of electrodes, at least one electrode out of said pair of electrodes being arranged
so as to be dipped into liquid; and
means for applying a pulsed power between electrodes of said pair of electrodes,
wherein at least one electrode dipped into said liquid is a rod shaped electrode whose
diameter is not more than 1 mm, whereby a field strength of a region in the vicinity of said at
least one electrode may have a value larger than 500 kV/cm at a voltage of not more than 100
kV.

FULL TEXT OF CASES (USPQ2D)

All Other Cases

In re Margolis, et al. (CA FC) 228 USPQ 940 (3/7/1986)



In re Margolis, et al. (CA FC) 228 USPQ 940

In re Margolis, et al.

U.S. Court of Appeals Federal Circuit
228 USPQ 940

Decided March 7, 1986

No. 85-2616

Headnotes

PATENTS

1. Patentability/Validity -- Obviousness -- Relevant prior art -- Particular inventions
(§ 115.0903.03)

Patent Office erred in rejecting applicants' coffee processing claims for obviousness as based solely upon prior art, without considering, as evidence of invention's unexpected results, data in specification comparing coffee made by claimed oxygen-free process with coffee produced without removal of oxygen.

Case History and Disposition:

Appeal from Patent and Trademark Office Board of Patent Appeals and Interferences.

Application for patent of Geoffrey Margolis, Alain Mercier, and Klaus Schlecht, application, Serial No. 297,324. From decision affirming examiner's rejection of claims 1-8, applicants appeal. Vacated and remanded.

Attorneys:

William H. Vogt, III, and Vogt & O'Donnell, both of White Plains, N.Y. (Glenn E. Karta, of counsel) for appellants.

Robert D. Edmonds, Associate Solicitor (Joseph F. Nakamura, Solicitor, and Fred E. McKelvey, Deputy Solicitor, on the brief) for Patent and Trademark Office.

Judge:

Before Markey, Chief Judge, and Smith and Newman, Circuit Judges.

Opinion Text

Opinion By:

Newman, Circuit Judge.

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Patent applicants Geoffrey Margolis, Alain Mercier, and Klaus Schlecht (hereinafter Margolis), assignors to Nestec, S.A., appeal the decision of the Patent and Trademark Office (PTO) Board of Patent Appeals and Interferences (the Board), that affirmed the rejection of claims 1 through 8 of patent application Serial No. 297,324 on the ground that the claimed invention would have been obvious under 35 U.S.C. §103. We vacate the decision and remand to the PTO.

Opinion

The claimed invention relates to the manufacture of soluble coffee, and is described as providing improved flavor retention without loss of yield. Claim 1 describes the process:

1. Process for extracting roasted and ground coffee comprising wetting, in the absence of oxygen, roasted and ground coffee having an average particle size not exceeding 2.0 mm, with at least twice its weight of an aqueous liquid, transferring the wetted coffee, out of contact with oxygen, to an extractor and extracting the coffee with an aqueous liquid at a temperature of at least 100°C.

Claims 2 through 8 were not argued separately, and need not be separately considered. *In re Sernaker*, 702 F.2d 989, 991, 217 USPQ 1, 3 (Fed. Cir. 1983).

The rejection under §103 as upheld by the Board was based on Nestle's British Patent No. 1,571,156 and certain pages of Volume I of M. Sivetz & H. Foote, *Coffee Processing Technology* [hereinafter cited as Sivetz]. The Board also referred to Epstein U.S. Patent No. 2,783,149.

The British patent describes the several steps of the disclosed process, including prewetting outside the extractor column, except for the requirement that oxygen be excluded during the two steps of prewetting and transfer. The Sivetz book was relied on for its teaching that "the most important factors affecting roast coffee shelf life are oxygen and moisture." The Epstein patent teaches the extraction of coffee using carbonated cold water, which "eliminates the oxidative action of atmospheric air and prevents deterioration of the coffee".

Margolis argues that although prewetting of the ground coffee is not new, it was considered disadvantageous to the flavor of the final product. Margolis cites the Sivetz book for its teaching that prewetting outside the extractor column "is bad because it causes staling of ground coffee in less than an hour, accompanied by a heavy undesirable flavor". Margolis asserts that he avoids these expected disadvantages by excluding oxygen in both the prewetting and transfer stages, and that neither his procedure, nor the advantages he achieves, is reported in an otherwise extensive prior art.

As evidence of his unexpected results, Margolis points to the data in the specification comparing coffee produced by his process with that produced without removal of oxygen, as follows:

Samples of instant coffee prepared according to a conventional method without pre-wetting (I), with pre-wetting in the percolator (II), according to Examples 1 (III) and 5 (IV), were evaluated by a panel of trained tasters. Their comments are summarized below.

Sample Comments

- I Full, balanced but with artificial acidity, process taste, instant coffee flavour
- II Full but with grounds flavour, cereal flavour, baggy taste
- III Full, balanced, clean, natural, neutral
- IV Full, balanced, aromatic, fresh, filter coffee flavour

The Examiner and the Board refused to consider this evidence, giving the reason that Margolis' Examples 1-6 in the specification do not recite that they were conducted in the absence of oxygen. Thus the Board held that "[w]e are apprised of no evidence showing that appellants obtained any unexpected results", and rejected the claims for obviousness in view of the prior art.

Margolis takes issue with the Board's reading of the specification. Margolis argues that the purpose of the specification is to describe and illustrate the claimed invention, and characterizes the Board's reading of the disclosure as "contrary to logic, reason, and the text of the specification". He points to various statements in the specification:

According to the invention the process comprises wetting, in the absence of oxygen . . . transferring the wetted coffee, out of contact with oxygen. . . .

and immediately preceding the examples:

The following examples are given for the purposes of illustrating the process according to the invention.

[1] We agree with Margolis that the Board's position is in error. It is plain that the examples illustrate Margolis' invention.

The specific examples provided the basis for the comparative data tabulated *supra*. The Board had not commented on the probative

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value of these data, in view of its criticism of the examples. Neither had the Examiner. The data which compare the products of examples 1 and 5 with conventional instant coffee must be considered in reaching a conclusion as to whether the claimed invention as a whole would have been obvious. Neither the prior art, nor the comparative data, is properly considered alone.

It is the entire body of evidence, that arising in the prior art and that provided by the applicant, which must be weighed in the first instance by the PTO. Because the Board did not consider Margolis' comparative data, the record before us is insufficient. 35 U.S.C. §144. To enable these further proceedings before the PTO, the decision of the Board is vacated and the case is remanded.

The Commissioner in his brief presented certain new arguments on this appeal, relying on references that had been before the Examiner, but raising objections under 35 U.S.C. §102 and §103 that had not been appealed to or relied upon by the Board. In the interest of an orderly and fair administrative process, it is inappropriate for this court to consider rejections that had not been considered by or relied upon by the Board. *In re Hedges*, No. 85-2524, slip op. at 3, 228 USPQ at 685 (Fed. Cir. Feb. 12, 1986); *In re Hounsfield*, 699 F.2d 1320, 1324, 216 USPQ 1045, 1048-49 (Fed. Cir. 1983).

VACATED AND REMANDED

- End of Case -

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